

# PATENT SPECIFICATION

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## (54) APPLICATION OF DYESTUFFS ETC. TO TEXTILE WEB

(71) We, BRUCKNER APPARATEBAU GMBH, a German Company, of 6122 Erbach/Odenwald, Werner-von-Siemens-Strasse, Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 This invention relates to a method for applying dyestuffs or other chemicals to a continuously moving textile web, using a liquid which at least in part consists of an organic solvent.

15 For the continuous dyeing of webs, for instance of woven or knitted textiles, with aqueous dye solutions, padders are known by means of which the dyestuffs (or other treatment chemicals) are applied with relatively larger amounts of liquor. In this case the padder fulfils a double function, since it firstly ensures uniform distribution of liquor across the width of the fabric and  
 20 secondly by means of the squeezing pressure ensures penetration of the dye into the fabric.

25 When the textile treated in this manner is finally dried, it is found extraordinarily difficult to prevent migration of the dissolved dyestuff in the web. To produce a uniform appearance in the fabric it is usually necessary to add thickeners or other media for preventing migration. On the  
 30 other hand with the aqueous liquors used hitherto it is not possible to reduce the amount of liquor without affecting the uniformity of the dye distribution.

35 The object of the invention is therefore to provide a method which enables dyestuffs or other finishing chemicals dissolved in an organic solvent to be applied as a liquid to a continuously moving textile web in such manner that migration phenomena are  
 40 avoided during subsequent drying or fixing.

[Price 33p]

According to the invention this object is achieved in that the liquid is applied by an embossed roller with a peripheral zone embraced by the textile web at a rate whereby a maximum of 500 ml. of solvent per 1000g  
 50 of textile to be treated is applied to the web.

In the tests on which the invention is based, it was surprisingly noted that because of their low surface tension, organic solvents (for example chlorinated hydrocarbons, esters, and ether) have ideal penetration properties, and hence ensure uniform distribution of the dyestuff within the textile web itself, even when very small  
 55 amounts of liquor are used. The low quantity of liquor provided in accordance with the invention (ie the use of a highly concentrated dyestuff solution) on the other hand strongly counteracts the risk of migration, since in general the tendency to migration in a fabric impregnated with dyestuff becomes less as the liquid contained in the material decreases.

If in accordance with the invention a dyestuff solution is applied to the fabric, the application is similar to printing, and because of the ideal penetration of the organic solvent, this small amount of fluid is uniformly distributed in the textile material. Because of the small amount of liquid present, migration phenomena are only observed during subsequent drying in very rare cases. A further notable advantage of the method provided by the invention lies in the considerable reduction in the amount of  
 65 70 75 80 drying needed.

The small amounts of solvent used with the method provided by the invention also permit the use of solvents whose recovery is relatively complicated. Because of the low amount of solvent it is in addition also possible to dispense with recovery altogether, and either to burn catalytically the solvent evaporated from the textile web,  
 85 90

or to convert it chemically by other means into a substance which can be released into the environment without objection.

The reduction of the amount of solvent provided in accordance with the invention assumes however that the solvent is applied with complete uniformity to the textile web. For this reason in accordance with the invention there is provided an embossed roller which is embraced by the textile web over a zone of its periphery. In this way the necessary intensity of contact is achieved without need to apply high pressure between the roller and the web; the numerous small recesses uniformly distributed on the embossed surface cause the dyestuff solution to be applied to the textile web uniformly and in finely divided form.

The dyestuff solution is applied to the roller periphery before the point of contact between the roller and the textile web. Application can be for instance by spraying or spreading; also the roller can be dipped into a vat filled with the dyestuff solution.

On leaving the application roller the web preferably passes through a chamber filled with saturated solvent vapour, before reaching a drying or fixing zone. The uniform distribution of the dyestuff over the entire web is completed during passage through this chamber.

The method provided by the invention is shown schematically in Figs. 1-4 of the drawings.

According to Fig. 1 the textile web 1 to be dyed first comes into contact with a peripheral zone of an embossed application roller 2 to which a liquid dyestuff solution is supplied by means of a spray device 3. This dyestuff solution is applied to the web preferably at a rate whereby 200-400ml of organic solvent for each 1000g of textile to be treated is applied to the web, though up to a maximum of 500ml of solvent may be so applied.

The web then passes through a chamber 4 filled with saturated solvent vapour. The web 1 then enters a drying zone 5 in which the dye is fixed. In view of the small amounts of fluid vaporised at this stage, no disturbing migration phenomena can occur in the web.

With the method provided by the application, the web can enter the dyestuff application station either dry or moist.

In Fig. 2 the application roller 2 dips into a vat 7 filled with dyestuff solution 6, with a doctor blade 8 stripping excess liquor from the roller 2 before said roller comes into contact with the textile web 1 being dyed, the solvent being applied at the rate referred to above.

Fig. 3 shows a variation wherein the dye liquor 6 is taken from a vat 7 and fed by a

pump 9 to a spray device 10 which sprays the liquor on to the periphery of the embossed application roller 2. A doctor blade 11 strips surplus liquor from the roller surface and the liquor drops back into the vat 7.

Finally Fig. 4 shows a plan wherein after passing the application roller 2 the textile web 1 enters a chamber comprising a vat 13 filled with solvent vapour 12 (this vapour 12 is kept in the vat by its high specific gravity as compared with air). Completely uniform distribution of the applied dyestuff is achieved in this chamber before the web proceeds through chamber 4 and enters the drying zone 5.

#### WHAT WE CLAIM IS:—

1. A method for applying dyestuffs or other chemicals to a continuously moving textile web, using a liquid which at least in part consists of an organic solvent, characterised in that said liquid is applied by means of an embossed roller with a peripheral zone embraced by the textile web at a rate whereby a maximum of 500ml. of solvent per 1000g. of textile to be treated is applied to the web.

2. A method as in claim 1, characterised in that 200 to 400ml of solvent per 1000g of textile is applied to the web.

3. A method as in Claim 1 or 2 characterised in that after passing the embossed roller the textile web passes through a chamber filled with saturated solvent vapour before reaching a drying or fixing zone.

4. A method as in Claim 1, 2 or 3 characterised in that the solution is applied by spraying onto the roller before the point of contact between the roller periphery and the textile web.

5. A method according to claim 1, 2 or 3 characterised in that the solution is applied to the roller before the point of contact between the roller periphery and the textile web by said periphery dipping into a vat of the solution.

6. A method according to claim 4 or 5 characterised in that excess solution is removed from the roller periphery by a doctor blade before said point of contact.

7. A method of applying dyestuffs or other chemicals to a continuously moving textile web substantially as hereinbefore described with reference to the accompanying drawings.

8. In a method for applying dyestuffs or  
other chemicals to a continuously moving  
textile web according to any one of the  
preceding claims, apparatus substantially as  
5 hereinbefore described with reference to and  
as shown in the accompanying drawings.

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Fig. 1

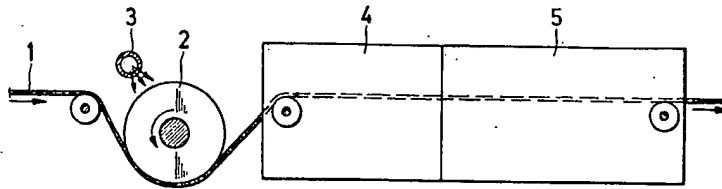


Fig. 2

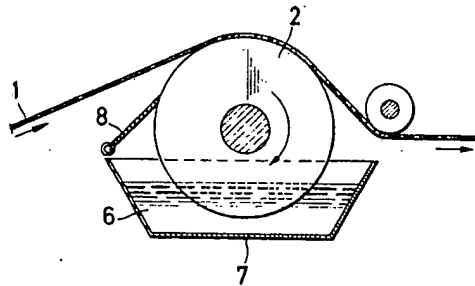


Fig. 3

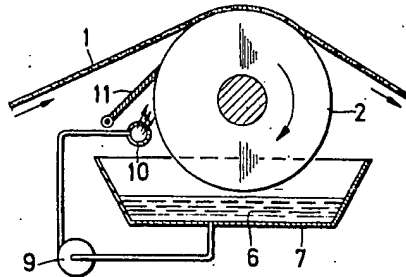


Fig. 4

